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**A Question of Balance: Metrics or Art for Joint Force Decision-Making?**

by

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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## **Abstract**

For centuries, an age-old debate has raged to determine whether military operations were an art or a science. Traditionalists cite Carl von Clausewitz and Sun Tzu for inspiration on the art of war, while the opposite camp looks to Antoine de Jomini and others to acknowledge their systematic approach to warfare. During the last several years of conflict in the Global War on Terrorism, the United States military has gone through many permutations of doctrine and practice in an effort to keep pace with the ever-changing operational environment. The complexity of the operating environment has encouraged the conceptual debate to reemerge between the art and science of operational warfare. In an effort to minimize ambiguity and achieve synergy between the levels of warfare, operational commanders have applied a systematic approach to define relationships, quantify, and measure progress of military and nonmilitary actions in the current operating environment.

Turning to metric-based approaches allows digestion of vast amounts of information and provides a method to measure the performance (MOP) and effectiveness (MOE) of operational tasks and effects. Operational commanders use these metrics to determine the completion of objectives while simultaneously measuring the causal effects of military and non-military actions in the operating environment. However, using metrics in isolation without the application of operational art introduces failure for the joint force to achieve objectives. Unfortunately, there are no foolproof methods to explain the appropriate proportion of art and science in operational decision-making. Because of this, the debate between military artists and scientists continues. However, it is through a balance of metric-based assessment and operational leadership, the joint force commander achieves synergy of the art and science of warfare for operational decision-making in the contemporary operating environment (COE).

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## **Nature of the Problem**

For centuries, an age-old debate has raged to determine whether military operations were an art or a science. The complexity of the contemporary operating environment (COE) coupled with military institutional biases and service ideology has encouraged the conceptual debate to reemerge between the art and science of operational warfare. During the last several years of conflict in the Global War on Terrorism, the United States military has gone through many permutations of doctrine and practice in an effort to keep pace with the ever-changing operational environment. This dynamic environment has affected all levels of warfare, but none as much as the operational level of war where joint force commanders face the daunting task of linking the national and theater strategic ends to tactical objectives.

In an effort to minimize ambiguity and achieve synergy between the levels of warfare, operational commands have applied a systematic approach to quantify and define relationships between tangible and intangible aspects of the operating environment. This metric-based approach allows digestion of vast amounts of information, and it measures the performance and effectiveness of operational tasks and effects. Operational commanders use these metrics to determine the completion of objectives while simultaneously measuring the causal effects of military and non-military actions in the operating environment. However, using metrics in isolation without the application of operational art stems failure for the joint force to achieve objectives. Because there are no foolproof methods to explain the appropriate balance between art and science in operational decision-making, errors occur and the debate continues. This debate leads one to ask several questions. Is there any utility for these effects-based assessments in the joint commander's decision-making process? Do measures of effectiveness really help the joint force commander to synchronize military and non-military operations to achieve the

objective? Alternatively, should operational commanders rely less on scientific metrics in warfare and more on tenets of operational leadership, battle command, and their innate military genius? If so, what is the appropriate balance between operational art and metrics for operational command decision-making in the contemporary operating environment?

The “wicked”<sup>1</sup> nature of the COE compels the joint force commander to apply both art and science in operational decision-making. The ambiguous interaction of tangible and intangible aspects of the COE creates ‘wicked’ challenges at the operational level of war. Traditional problem-solving techniques alone cannot address the complexity of the COE for military commanders and their staffs. The wicked challenges presented by the COE provide an opportunity for military artists and scientists to establish common ground through operational decision-making. In order to synchronize military and nonmilitary resources effectively, a joint force commander must establish balance between metric-based assessments and operational leadership to achieve objectives in the COE.

To understand the dynamics of operational decision-making in the COE, it is important to discuss the nature of the debate between traditional, objective-based military artists and current, effects-based scientists. With an understanding of the debate between these two camps, it is necessary initially to define contemporary terminology and then establish a framework to address the creative and analytical components of operational decision-making. By applying this operational decision-making framework to recent conflicts in Lebanon and Iraq, one will conclude that it is only through an application of both metric assessment and sound operational leadership that a joint force commander can effectively synchronize military and nonmilitary power to achieve the desired operational objective.

## **A Debate Between Two Camps**

During the Vietnam War, the United States military's operational commanders developed a series of metric-based approaches to measure the progress of counterinsurgent efforts. From body counts to ammunition expenditures,<sup>2</sup> these measurements failed to provide a means to synchronize military and non-military resources to achieve strategic effects and a victory in the conflict. Since Vietnam, the United States military ground force's aversion to a systematic or scientific approach to warfare swung the pendulum to the opposite extreme where operational art reigned supreme.<sup>3</sup> America would fight and win wars at the operational level through deliberate planning, battle command,<sup>4</sup> operational leadership, and the military genius of the commander. During Operation Desert Storm, the Air Force fomented technological advancements and boasted that airpower could create the psychological effects to compel Saddam Hussein to acquiescence to American strategic ends.<sup>5</sup> However, traditional, maneuver warfare enthusiasts discounted the airpower theories of victory, and ground forces led the decisive military operations against belligerents in Kuwait. Air power enthusiasts again emerged and deterrence operations against Iraq and incursions in Bosnia and Kosovo required little 'boots on the ground.'<sup>6</sup> As the United States military entered the new millennia, air power enthusiasts coined effects-based operations and the "joint community [began] to evolve their understanding of effects" in joint doctrine.<sup>7</sup>

After 9/11, ambiguity in the operating environment encouraged the development of a systematic approach that would "improve unity of effort between military, interagency, multinational partners, and nongovernmental organizations at the operational level."<sup>8</sup> With new civilian leadership at the helm, the Department of Defense began transformation to become more agile, lethal, flexible, and interoperable. To become more interoperable or 'joint' meant coming

to grips with joint operations and warfighting. Proponents of airpower believed it was time for the joint force to adopt a new effects-based approach to joint operations and assessments. The Effects-Based Operations (EBO) concept would be “a springboard for the better linking of military, economic, information, and diplomatic instruments of power to conduct security strategy in depth.”<sup>9</sup> A systems or scientific approach could relate cause and effect to operations and airpower combined with special operations could achieve strategic objectives without expending much American blood or treasure.

Unfortunately, traditionalists quickly attacked the systematic approach to warfare contending that friction and Clausewitz’s fog of war would prevent any meaningful prediction of indirect attacks of enemy centers of gravity and causal relationships through scientific analysis of human factors. Some adversaries of change actively discounted emerging effects-based concepts. According to Marine Lieutenant General Mattis, Commander of United States Joint Forces Command,

You cannot take down a government . . . the same way you can an electrical grid. . . when you enter into the areas where human beings—with their willpower, their imagination, their courage, their fears, their cultural tendencies—all come to bear, the idea that you can put an algebraic equals sign between something you do and the response that you’re going to get is not borne out by the last 5,000 years of human interactions on this planet.<sup>10</sup>

Students of the traditional school of thought, like Lt Gen Mattis and Lt Gen (retired) Van Riper, see merit in some analytical decision-making processes, but not effects-based operations.

Instead of scientific methods and systems analysis, traditionalists believe operational art and design provides the operational commander with the tools to link strategic ends to tactical tasks.

For traditionalists, the joint force commander must “understand the relationship among operational art, strategy, and tactics” across the instruments of national power, and apply operational leadership to achieve “assigned operational or strategic objectives.”<sup>11</sup>



## Contemporary Terminology

In recent years, changes in operational environment have led joint doctrine to expand concepts of combat and operational assessment. Contemporary joint doctrine now assesses the results of military and non-military power on the battlefield through measures of performance and effectiveness. The effects-based, scientific approach to decision-making has “expand(ed) combat assessment to provide for measuring progress toward desired effects and operational and strategic objectives.”<sup>12</sup> Measures of Performance (MOP) are not a huge step for the traditional, post-Vietnam military. MOPs assess progress by measuring the completion of a task. For objective-based operations, tasks are a natural subcomponent of objectives. The heresy for objective-based proponents surfaces in the concept of Measures of Effectiveness (MOE). Traditionalists agree that for every military task there is an effect on the environment; however, they see no merit in attempting to predict the outcome of task completion based upon a specific desired or undesired effect.<sup>13</sup> War does constitute the interaction of humans, and it is true that these interactions are difficult to predict. However, this fact does not admonish an operational commander from the responsibility to assess the COE and measure the effectiveness of military and nonmilitary actions in relation to the objective. “Well-devised measures can help commanders and staffs understand the causal relationship between specific tasks and desired effects.”<sup>14</sup> A measurement of tangible tasks and intangible human behavior provides the staff with metrics of effects that fashion a more feasible, acceptable, and realistic course of action for an operational leader’s decision.

Artists of warfare view leadership as a component of operational art that relates to the knowledge, skills, and abilities of the joint force commander. These proponents can trace the characteristics of sound operational leadership to Clausewitz’s description of military genius. In

Chapter 3 of his treatise, *On War*, Carl Von Clausewitz describes the ultimate military commander as one that demonstrates self-control, will, physical and moral courage, intuition, and *coup d'oeil* or eye for sound decision-making.<sup>15</sup> For Clausewitz, the success of the French military was a direct result of the military genius of Napoleon Bonaparte and his ability to employ professional skill and military acme to overcome uncertainty in the environment. Operational artists believe that Clausewitz's depiction of Napoleon's military genius provides the paradigm for operational leadership, thinking, and vision. In "command-centric operations,"<sup>16</sup> the commander exhibits the innate capability to synchronize all military and nonmilitary elements of power to pursue military objectives and compel the enemy to do one's will. An operational commander must "possess a rare combination of high professional education, diverse training, combat experience, and the great character traits necessary for success at the operational level of command."<sup>17</sup> This military genius continually assesses and reassesses of the situation to enable "timely recognition of circumstances the moment when a new decision is required."<sup>18</sup> It is critical for the joint force commander to not only possess and exhibit operational leadership, but to guide his staff to understand the environment and properly integrate all military and nonmilitary power to achieve the operational end state. This becomes the art of operational decision-making.

### **Framework for Operational Decision-Making in the COE**

Operational decision-making in the COE is difficult. To mitigate the ambiguity of the environment, a military scientist will offer the operational commander metrics to provide basis for decision-making. In the opposite manner, the military artist will offer operational leadership and the military genius of the commander as the decisive factors of operational decision-making. In order to frame the value of these two arguments, one must analyze decision science and

operational leadership through the lens of effects-based assessments to determine the effectiveness of measuring tangible and intangible aspects of the environment. This analysis allows one to consider the employment of operational leadership complemented by metric assessment to enable operational decision-making.

American joint doctrine provides several methods to assist the commander in the decision-making process. Some methods are analytical, while others are more creative in their approach. A popular joint analytical decision-making model, the Joint Operational Planning Process (JOPP),<sup>19</sup> incorporates rational deduction to identify the problem, develop and compare courses of action, and offer the commander options for decision. Another method, operational art, represents a creative approach to operational decision-making that applies the “imagination by commanders and staffs—supported by their skill, knowledge, and experience”<sup>20</sup> to develop operations for military forces. In recent versions of joint doctrine, the effects-based approach combines analytical and creative problem solving techniques for decision-making. This concept “provide(s) a more comprehensive and realistic understanding of the complex environment in which we live, work, and fight wars,”<sup>21</sup> and combines objective and a subjective measures to determine the effectiveness military and non-military actions. The effects-based assessment combines traditional MOP and contemporary MOE to measure tangible or intangible progress of operations and determine intended or unintended effects of these operations. The assessment of an effect of a military action does not supplant the importance achieving the objective. Instead, effects analysis is “a value added step”<sup>22</sup> because it measures the predictive or actual effects of military and nonmilitary tasks on the operating environment. This systematic analysis complements the decision-making process by providing the commander with smaller, more digestible information consideration.

Equally, effects-based assessment does not detract from a command-centric approach to operations. “For better or worse, the interpretation of (effects) frequently forms the structure on which senior leaders base their orders...consequently, the need to carefully select MOE is extreme.”<sup>23</sup> The operational commander demonstrates *coup d’oeil* by providing the staff with the guidance for the development of lines of effort, determination of decisive points, and metrics to assess task performance and effectiveness. Because MOP and MOE “determine the progress of operations toward achieving objective,”<sup>24</sup> the commander can use these measurements to guide order production and shape the fight for subordinate commands. Continuous assessment and reassessment of task performance and the effects of military and nonmilitary actions, helps the joint force commander “determine if the joint force is ‘doing the right things’ to achieve objectives, not just ‘doing things right.’”<sup>25</sup> Given the quantifiable nature of metric assessments, the operational and subordinate commander’s involvement is critical in the development, implementation, assessment, and reassessment of measurements. The operational commander’s leadership is the essential ingredient that balances metric assessments in operational decision-making. Through an analysis of the 2006 Israeli-Hezbollah War and current Coalition operations in support of Operation Iraqi Freedom, one can determine the influence or balance of metrics and leadership in contemporary operational decision-making.

#### **Analysis of Case #1: Israeli-Hezbollah War 2006**

In June 2006, Hezbollah conducted a raid on a border checkpoint and seized two Israeli Army soldiers. Over the previous several years, the sub-national ‘Party of God’ built an impressive arsenal of “sophisticated Syrian and Iranian arms,” technology, and trained extensively to become a “professional fighting force.”<sup>26</sup> For Israel, limited strategic objectives defined the nature of this conflict. Israel wanted to weaken Hezbollah military capabilities and

coerce the Lebanese government to obtain control of its sovereignty without introducing a large ground occupation force.<sup>27</sup> Israel believed that “if Lebanon, not just Hezbollah, was made to suffer for Hezbollah’s adventurism, Lebanon’s political will to rein Hezbollah in would finally increase.”<sup>28</sup>

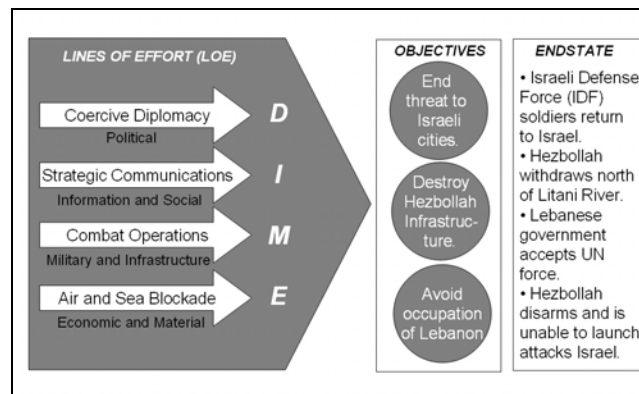


Figure 1-1. IDF Lines of Effort during Israeli-Hezbollah War 2006<sup>29</sup>

From the onset of the war, the Israeli military strategy followed essentially four lines of effort: coercive diplomacy, strategic communications, combat operations, and air and sea blockade (Figure 1-1). Initially, Israel established air and sea superiority in an effort to isolate Lebanon and interdict the flow of warmaking material from Syria and Iran. Tied to this first military objective was the air campaign under the direction of the Israeli Air Force (IAF) to destroy critical capabilities of Hezbollah’s terrorist organization. Israeli threat assessment noted Hezbollah’s military capabilities, distributed and decentralized command structure, logistics and resupply architecture, and their asymmetrical strengths. “The military hierarchy led by Lieutenant General Halutz [Israeli Defense Force Chief of Staff] was convinced that communications and air power, rather than troops, would rapidly win Israel’s wars.”<sup>30</sup> As the former IAF commander, Halutz recommended an air campaign that would degrade Hezbollah capabilities to threaten Israel and simultaneously encourage legitimate Lebanese forces to exert control over southern Lebanon. The Israeli cabinet and Prime Minister Olmert “agreed that there would be no attacks on electrical power or water-related installations”<sup>31</sup> in Beirut and precision

fires would limit non-combatant casualties. Israeli strategic communications would demonstrate the justice of the war through proportionality to prevent media coverage of unnecessary Lebanese suffering. Finally, Israel would use diplomacy to “create a new order on the basis of implementation of UNSCR 1559”<sup>32</sup> and force Lebanese compliance with directives to disarm Hezbollah.

The Israeli indirect approach to disrupt Hezbollah and coerce the Lebanese government’s acquiescence drove their measurements of performance (MOP) and effectiveness (MOE). Initially, Israel measured effectiveness based upon the neutralization of Hezbollah traditional military capabilities. However, IAF’s effects-based air campaign failed to have a predicted disruptive effect on Hezbollah’s stand-off weapons causing Israeli border settlements to suffer from large volumes of indirect fire.<sup>33</sup> Applying asymmetrical techniques, “Hezbollah commanders successfully penetrated Israel’s...decision-making cycle across a spectrum of intelligence, military and political operations”<sup>34</sup> and prevented disruption of their own military capabilities. In response, the IAF became less discriminate in its air campaign targeting procedures and mission creep led to the inclusion previously off-limit targets that negatively affected Lebanese noncombatants. Unfortunately, completion of tasks spurned negative cascading effects on the conduct of Israel’s strategic communications and diplomacy as Israel neglected proportionality and lost legitimacy. “Poor planning, intelligence failures and an overreliance on airpower... [resulted in] large numbers of civilian casualties and destroyed infrastructure embitter[ed] local populations.”<sup>35</sup>

At the strategic level, Israel lost the war. The conflict demonstrated Israel’s overreliance on metrics and a lack of operational leadership that was “too narrowly air-oriented and [presented] unrealistic estimates of what air power can accomplish.”<sup>36</sup> Combining effects-based

operations with a new Systemic Operational Design (SOD) concept, the IDF attempted to use “standoff firepower-based operations”<sup>37</sup> to minimize risk to Israeli soldiers and create a “cognitive perception of defeat”<sup>38</sup> for Hezbollah. Based upon the principles of operational leadership, the SOD concept is an “intellectual exercise that draws on the creative vision, experience, intuition, and judgment of commanders”<sup>39</sup> to develop operational plans with respect to a dynamic threat. Unfortunately, the concepts were unknown to senior leadership, and its application resulted in unnecessary friction for operational commanders. Without a clear understanding of the doctrinal concepts, General Halutz focused too much on maintaining an economy of force with partial commitment of forces to prevent significant loss of Israeli blood and treasure. His failure to reassess Israel’s initial plan to indirectly attack and degrade Hezbollah military capabilities contributed to IDF’s failure to achieve objectives.

The Israeli Defense Force failed to balance effects-based assessments and operational leadership to set the conditions for an operational decision. Initially, the IDF failed to identify properly Hezbollah’s strength, capabilities, and center of gravity. Poor reassessment of MOP and MOE combined with institutional biases tainted IDF leadership’s ability to recognize the limitations of airpower to achieve tangible and intangible effects against an elusive enemy. “Once again, the idea that air power can be a substitute for military skill on the ground or patient resolution of disputes is proving beguiling but illusory.”<sup>40</sup> After two weeks of bombing Hezbollah targets, the joint force commander failed to sequence properly ground forces against known enemy positions opting instead to employ close air support and indirect fire from distance to minimize army casualties. By pushing “proportionality to its limits (and) attacking civilian targets that were not related to the Hezbollah in an effort to force the Lebanese government to act,”<sup>41</sup> the operational commander failed to learn and apply lessons of recent conflicts. The

failure of the operational commander to balance assessments and operational leadership led to poor operational decision-making. The IDF's overreliance on an indirect, effects-based operation absent command-centric, operational leadership resulted in Israel's failure to achieve a decision over Hezbollah.

Understanding the difficulty of analyzing an ensuing conflict, Operation Iraqi Freedom (OIF) presents an interesting case to consider the application of both metric-based assessment and command-centric decision-making at the operational level. Recognizing the difference between a conventional conflict and a counterinsurgency, similarities exist between the operating environments of both Israeli-Hezbollah War 2006 and OIF conflicts. Both conflicts highlight non-state and sub-national actors using asymmetric warfare to achieve strategic effects against a stronger, more technologically equipped power. The asymmetric nature of the conflict compels an operational commander to consider the use of metric-based assessments to analyze the environment and systematically measure effects and task performance. Finally, as in Case #1, the COE in OIF affords the joint force commander the opportunity to leverage operational leadership with these metrics to develop lines of effort to achieve operational objectives.

#### **Analysis of Case #2: Operation Iraqi Freedom VIII-IX, 'The Surge'**

In January 2007, President Bush announced that the Department of Defense would 'surge' 30,000 additional security forces to Baghdad to defeat insurgents and provide the fledgling Iraqi government with space and time to gain legitimacy.<sup>42</sup> Multi-National Force-Iraq (MNF-I) would assist Iraqi security forces to "secure its base area"—Baghdad.<sup>43</sup> MNF-I, and its subordinate commands, developed several lines of effort for surge operations that focused on the capacity of Iraq security, economics, governance, and information. For the purpose of unclassified analysis, one can use four generic LOOs (Figure 1-2) to address the application of



metrics and operational art for joint force decision-making during Operation Iraqi Freedom VIII-IX.

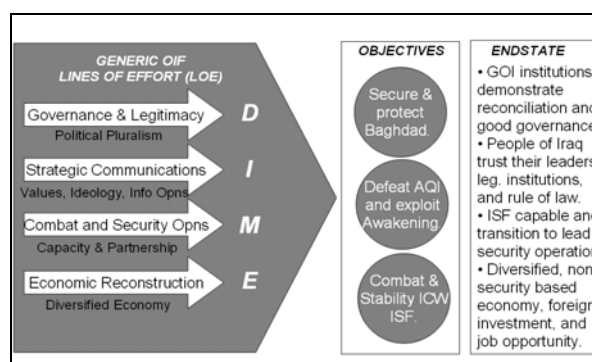


Figure 1-2. Generic OIF VIII-IX 'Surge' Lines of Effort<sup>44</sup>

For the MNC-I Command Group, measurement and assessment were important to track progress of tasks and effects to achieve objectives along the LOEs.

Legislation passed, provincial/national budget execution, etc. are clear metrics for governance. Small businesses opened, the cost of goods, the cost of licenses and leases, state owned enterprise production, oil export, power generation, etc. are the some of the metrics for economics.<sup>45</sup>

The nature of Iraq COE permits operational commanders to assess the effects of military and nonmilitary actions on objective achievement. At the operational-tactical level of war during the Surge campaign, the 1<sup>st</sup> Cavalry Division Headquarters was assigned the mission as Multi-National Division-Baghdad. The J-5 Strategic Plans cell developed a systematic approach to metrics labeled the Baghdad Effects and Assessment Model (BEAM). The purpose of BEAM was to provide the operational commander with “a subjective and objective”<sup>46</sup> measurement of the progress of lines of effort in the First Team area of operations. The purpose of this tool was to allow the operational staff to provide the Division Command Group with quantitative data that supported subordinate efforts.<sup>47</sup> Using an effects-based approach to assessment, “the monthly BEAM assessment...would ultimately lead to discussions on how to fix (shortcomings) and generate FRAGOs [fragmentary orders] for [subordinate] units to execute.”<sup>48</sup> Although

extremely useful for staff visualization and a systematic assessment of the COE, metric assessments, like BEAM, “are not the primary source”<sup>49</sup> for decision-making at the operational level of war.

According to former MNC-I Chief of Staff, Brigadier General Joseph Anderson, “human factors far outweigh metrics in the decision-making process.”<sup>50</sup> The experience and instinct of the operational commander and his subordinate tactical commanders constitute the most important factors for operational decision-making in war.<sup>51</sup> Take for example one intermediate objective of the Surge, the arming of Sunni militia in Al Anbar Province to secure critical infrastructure. Eventually these efforts had a positive effect on security in an area once considered the ‘Wild West,’ however, there were several unintended effects of these operations. Because “the most difficult prediction is [to determine] what physical actions must be accomplished to generate desired behavioral effects over time,”<sup>52</sup> Coalition forces had to weigh the benefits and predict the effect of arming Sunni militia. Was the creation of new militia security forces and its effect to achieve security more important than the potential threat that these forces constituted to the legitimacy of provincial and central Iraqi governments? In another case, recent Iraqi military operations in Basra against the Shi’i extremist clearly demonstrate the extreme complexity of military and nonmilitary operations in Iraq. This case presents another example where metrics alone can spell failure for Iraqi government legitimacy and security gains. The efforts of the ‘Surge’ operations, the legitimacy of the central government and its institutions, and the progress towards Iraqi self-determination could be lost if the violent clash between Sadr’s Madhi Army and Maliki’s Dawa party continues.<sup>53</sup> Operational commanders will have to measure the progress of security and governance, and weigh American commitments in Iraq in the face of violent, internal political power struggles. In these cases, the military

genius must consider the utility of metrics to achieve objectives, but balance this systematic approach with experience and human factors to mitigate causal risk. Because of the complexity of Iraq's 'wicked' operating environment, it is necessary to integrate operational art, command-centric leadership, and metrics of task performance and effects at the operational level of war.

## **Conclusions**

Operational level commanders must incorporate metrics and leadership for effective operational decision-making. During the Israeli-Hezbollah conflict, a systems approach to warfighting absent operational art spelled failure for the IDF. Unlike the IDF, Coalition forces in OIF use a combination of metric assessment and command-centric operations to integrate military and nonmilitary power to achieve the objective. From the presentation of data to display progress of governance and reconciliation in a given province to the number of improvised explosive devices found and cleared, assessments of performance and effectiveness assist commanders with achieving synergy of effort in the COE. A systematic approach to decision-making absent operational art fails to adequately synchronize and leverage all military and nonmilitary power to achieve an objective. An effects-based approach does simplify the complexities and ambiguities of the environment by providing a method to measure and assess the accomplishment of tasks and their effects. However, Clausewitz would turn over in his grave if he heard that operational commanders were solely applying scientific approach to warfare. The joint force commander must continue to leverage experience, skill, adeptness, and military genius, and that of his subordinate commanders, to prevent a faulty overreliance on metrics.

It is difficult to determine the appropriate balance of metrics and leadership in operational decision-making. As seen during the 'Surge' operations in OIF, the joint force commander cannot draw the scale of 'Lady Justice' on a dry erase board to graphically display the

proportionality of measurements to art for his staff. Balance in operational decision-making is more 'A Boxer's Stance' that allows the commander to shift the weight of measurement and intuition based upon his vision, intent, and guidance. This guidance permits the staff to develop lines of effort and measures to achieve the commander's end state. The commander's intent allows subordinate commands to understand the operational purpose, essential tasks, and end state so they can operate independently to achieve the commander's desired effect. Operational art alone does not allow the joint force commander to synchronize power adequately to achieve the objective in the joint operating environment. However, effects-based assessments combined with tenets of command-centric operations simplify the joint force decision-making process and achieves balance.

Currently, joint force doctrinal development requires a complete overhaul. Joint doctrine has become a composite or compilation of the practices of each institution and service community. Organizational culture, institutional biases, and resistance to change create situations where proponents and opponents of emerging doctrinal concepts clash without regard to current practice or application in war. Because of this, joint force commanders face significant divergence of doctrinal publications, practices, techniques, and procedures at the operational level of war. The debates that continue between objective-based operational artists and effects-based scientists create friction at a critical level of command that synchronizes both military and nonmilitary actions from the strategic objective to the tactical task. As a British Chief of the General Staff stated, "the modern battlefield is not a place where we could hope to succeed by muddling through."<sup>54</sup> With the complexity of the joint operating environment, the joint force needs doctrine that is not at odds with divergent and controversial aspects. As seen during the OIF 'Surge,' when military forces remain learning organizations, prepared to reassess

and adapt to changes in the dynamic environment, they succeed. The United States military needs to shed institutional biases to move beyond the debate between military artists and scientists. By adapting to change, finding middle ground on doctrine, and representing the characteristics of a learning organization, the American military can remain relevant in the COE.

## **Recommendations**

The proper use of terminology at the operational level is crucial to a common understanding for joint and combined operations. Although a debate will continue to exist between the objective-based traditionalists and the effect-based proponents, the reality is that operational commanders and their staff combine operational art and an effects-based approach in the decision-making process. Operational commander's in both Iraq and Afghanistan already combine an art and the "systems perspective" to "effects in the planning process and assessment of effects"<sup>55</sup> to synchronize military and nonmilitary power effectively. Scientific approaches do not supplant operational art, but rather complement the creative aspects of operational decision-making. However, it is necessary for the operational commander and staff to discriminate the careful use of proper joint terminology. In order to prevent the discredit of new operational concepts, "some [terms] need to be modified because of changing practices."<sup>56</sup> Proper use of terminology "accurately conveys...operational perspective" while failure to do so only "complicates communications within a Service and...with allies and prospective coalition partners."<sup>57</sup> As one planner from CJTF-82 in Afghanistan put it, "when operating in a joint or coalition environment, there is very little latitude for playing fast and loose with terminology because of the confusion it brings."<sup>58</sup> The application of common doctrinal terminology through operational assessment can help mitigate the debate between artists and scientists. A holistic operational assessment in the COE must incorporate both scientific metrics and operational art

concepts; however, common terminology is what binds this assessment in the operational decision-making process.

Operational commanders should be intimately involved in the development of metrics that measure the tangible and intangible aspects of the operational environment with respect to their objective. The joint force commander provides the critical link between the strategic end state and tactical tasks. The ability of the operational commander to understand the complexity of the operational environment and provide commander's intent, vision, and leadership to his staff, permits the transparency and decentralized execution required of the counterinsurgent. When a commander develops measurements with his staff, the activity "gives more precision to an effect and lessens the opportunity for subordinates to misinterpret the commander's intent."<sup>59</sup> By incorporating the commander's guidance and direction into the development of metrics, the staff is able to link measurements to critical information requirements to determine whether to recommend a change to the conduct of operations.<sup>60</sup> Without proper command emphasis, measurements do not adequately support the commander's decision-making process. However, with proper command emphasis a measurement combined with operational art provides the staff with the ability to develop operations that shape and allocate military and nonmilitary resources for a tactical commander's fight.

Although the Army's new version of *Field Manual 3-0 Operations* and the revision of *Joint Publication 3-0 Joint Operations* have little or no reference to effects-based operations,<sup>61</sup> the services have adopted effects-based thinking to assess the complex COE, MOPs, and MOEs. The incorporation of these concepts hint at the complementary value added of effects-based thinking and systematic approaches to assessment for operational decision-making. Even if the phrases effects-based operations or effect-based approach become stricken from the approved

military vernacular, effects-based concepts have fortified metric assessment and measurements of effectiveness into joint and service doctrine. The United States military continues to face a complex COE where counterinsurgency, nation building, stability and reconstruction operations reign supreme. However, as there remains the potential for near-peer competitors to challenge American interests within this COE, the United States military must consider alternatives to traditional approaches to warfare. Future conflicts will continue to present ‘wicked’ challenges for the operational commander. The Joint force must transcend simple inter-service rivalry, biases, and inconsistent ideology. The balance of metric assessments and operational leadership in decision-making demonstrates how the United States military remains flexible in its application of the science and art of warfare in order to counter changes and win wars in a dynamic COE.

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<sup>1</sup> William J. Hartig, “Problem Solving and the Military Professional,” Joint Military Operations Department (Newport, RI: United States Naval War College, October 2007), 5-6. In the article, Colonel Hartig captures Horst Rittel and Melvin Webber’s discussion of ‘tame’ and ‘wicked’ problems from the 1973 article, “Dilemmas in a General Theory of Planning” in *Policy Sciences*. Colonel Hartig describes ‘tame’ problems as a method to present complex situations in a well-defined, structure problem statement. The opposite of a ‘tame’ problem, a ‘wicked’ problems “common in diplomatic, informational, military, and economic realms” are too complex to structure with a well-defined problem statement. The current operating environment presents ‘wicked’ challenges to the operational commander and his staff.

<sup>2</sup> Andrew F. Krepinevich, Jr., *The Army and Vietnam* (Baltimore, MD: The Johns Hopkins University Press, 1986), 202.

<sup>3</sup> Shimon Naveh, *In Pursuit of Military Excellence: The Evolution of Operational Theory* (London: Frank Cass Publishers, 1997), 256-259. In his book, Shimon Naveh illustrates a conceptual revolution in military affairs that was a result of the strategy of attrition warfare devised by Secretary of Defense McNamara and General Westmoreland for Vietnam. The chapter identifies the contribution of William Lind and other civilian reformers that were integral to a professional debate over Army doctrine, *FM 100-5 Operations*, published in 1976. Lind argued that the United States Army needed to focus on operational art, specifically operational maneuver warfare, in order to introduce an alternative to the systematic application of tactical patterns for operational solutions. Lind’s concepts and the professional debate contributed greatly to “military reformers who would formulate the future Airland Battle,” 258.

<sup>4</sup> Headquarters Department of the Army, *FM 100-5 Operations*, June 1993, Glossary-1. *FM 100-5 Operations* defines battle command as the “the art of battle decision making, leading, and motivating soldiers and their organizations into action to accomplish missions,” Glossary-1. The Army’s concept of battle command in previous versions of doctrine paralleled the concept of operational leadership focusing exclusively on the ability of the commander to visualize the battlefield and communicate intent to subordinate commands.

<sup>5</sup> Michael R. Gordon and General Bernard E. Trainor, *The General’s War* (New York: Little, Brown and Company, 1995) 99.

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- <sup>6</sup> Andrew F. Krepinevich, Jr., "The Thin Green Line," CSBA Report, Center for Strategic and Budgetary Assessments, 14 August 2004. <http://www.csbaonline.org/4Publications/PubLibrary/B.20040814.GrnLne/B.20040814.GrnLne.pdf> (accessed 4 April 2008).
- <sup>7</sup> Joint Warfighting Center, *Commander's Handbook for an Effects-Based Approach to Joint Operations*, Joint Concept Development and Experimentation Directorate Joint Forces Command, Suffolk, VA : 24 February 2006, cover letter.
- <sup>8</sup> Ibid, I-1.
- <sup>9</sup> David T. Buckwalter, *Systemic and Effects-Based Thinking: A Synthesis of Analysis and Creativity*. National Security Decision Making Department Paper, ECS 8-1 (Newport, RI: United States Naval War College Press, April 2006), 4. Professor Buckwalter cites the Van Riper-Deptula email exchange in December 2006, where Lt Gen Van Riper, USMC, retired, explained his concerns over effect-based operations to Lt Gen David Deptula, USAF.
- <sup>10</sup> Paul K. Davis and James P. Kahan, *Theory and Methods for Supporting High Level Military Decisionmaking* (Santa Monica, CA: RAND, Air Force Projects, 2007), 64.
- <sup>11</sup> Milan N. Vego, *Joint Operational Warfare: Theory and Practice* (Newport, RI: United States Naval War College Press, 2007), X-13.
- <sup>12</sup> The Joint Warfighting Center. "An Effects-Based Approach: Refining How We Think about Joint Operations." *Joint Forces Quarterly* 44, (1<sup>st</sup> Quarter 2007), 2. [http://www.ndu.edu/inss/Press/jfq\\_pages/editions/i44/19.pdf](http://www.ndu.edu/inss/Press/jfq_pages/editions/i44/19.pdf) (accessed 4 April 2008).
- <sup>13</sup> Milan N. Vego, "Effects-Based Operations: A Critique," *Joint Forces Quarterly* 41, (2<sup>nd</sup> Quarter, 2006), 52.
- <sup>14</sup> The Joint Warfighting Center, "An Effects-Based Approach: Refining How We Think about Joint Operations," 4.
- <sup>15</sup> Carl Von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1976), 100-112.
- <sup>16</sup> General (ret) Gary Luck, "Insights on Joint Operations: The Art and Science, Best Practices-- The Move toward Coherently Integrated Joint, Interagency, and Multinational Operations," (Norfolk, VA: Joint Warfighting Center, U.S. Joint Forces Command, 30 September 2006), 6. General (ret) Luck describes Clausewitz's concept of the military genius as "command-centric operations" where the commander is the critical component in the decision-making process.
- <sup>17</sup> Milan N. Vego, *Joint Operational Warfare: Theory and Practice*, XI-30.
- <sup>18</sup> Ibid, X-79.
- <sup>19</sup> The Joint Chiefs of Staff, *JP 5-0 Joint Operational Planning*, 26 December 2006, I-11.
- <sup>20</sup> The Joint Chiefs of Staff, *JP 1-02 Department of Defense Dictionary of Military and Associated Terms*, 17 October 2007, 389.
- <sup>21</sup> Buckwalter, 8.
- <sup>22</sup> Rowlett, Rick. "An Effects-Based Approach to Joint Operations—Where Are We Now?" *A Common Perspective: US Joint Forces Command Joint Warfighting Center Doctrine and Education Group's Newsletter* 13, No. 2 (October 2005), 11. [http://www.dtic.mil/doctrine/jel/comm\\_per/acp13\\_2.pdf](http://www.dtic.mil/doctrine/jel/comm_per/acp13_2.pdf) (accessed 4 April 2008).
- <sup>23</sup> William S. Murray, "A Will to Measure - Measures of Effectiveness in Military Decision-making," *Parameters* (Autumn 2001), 1. <http://www.carlisle.army.mil/usawc/parameters/01autumn/Murray.htm> (accessed 4 April 2008).
- <sup>24</sup> The Joint Chiefs of Staff, *JP 3-0 Joint Operations*, 13 February 2008, IV-33.
- <sup>25</sup> Ibid, IV-32.
- <sup>26</sup> William M. Arkin, "Divine Victory for Whom?: Airpower in the 2006 Israeli-Hezbollah War," *Strategic Studies Quarterly* 1, No. 2, (Winter 2007), 104, <http://www.maxwell.af.mil/au/ssq/2007/Winter/arkin.pdf> (accessed 4 April 2008).
- <sup>27</sup> Anthony H. Cordesman, *The Road to Nowhere: Everyone's Strategic Failures in Lebanon*. CSIS Report (Washington, D.C.: Center for Strategic and International Studies, 21 July 2006), 4. [http://www.csis.org/media/csis/pubs/060721\\_nowhere.pdf](http://www.csis.org/media/csis/pubs/060721_nowhere.pdf) (accessed 4 April 2008).
- <sup>28</sup> Dov Waxman, "Between Victory and Defeat: Israel After the War with Hizbollah," *The Washington Quarterly* 30, (Winter 2006-2007), 29. [http://www.twq.com/07winter/docs/07winter\\_waxman.pdf](http://www.twq.com/07winter/docs/07winter_waxman.pdf) (accessed 4 April 2008).
- <sup>29</sup> David J. McCauley, "Israeli-Hezbollah Conflict of 2006: EBA in Joint Ops." *Fires*. (September-December 2007), 52. [http://sill-www.army.mil/firesbulletin/2007/Sep\\_dec\\_2007/Sep\\_Dec\\_2007\\_pages\\_50\\_55.pdf](http://sill-www.army.mil/firesbulletin/2007/Sep_dec_2007/Sep_Dec_2007_pages_50_55.pdf) (accessed 4 April 2008). COL McCauley designed Figure 1-1, IDF Lines of Effort during Israeli-Hezbollah War 2006 based upon his research of the conflict. I modified COL McCauley's Israeli "diplomacy" LOO to "coercive diplomacy" because Israel intended to use diplomacy to coerce Lebanon to disarm Hezbollah.



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- <sup>30</sup> Andrew Brookes, "Air War Over Lebanon." (London, UK: The International Institute For Strategic Studies, 8 August 2006), 3. <http://www.iiss.org/programmes/defence-analysis-programme/analysis-archive/air-war-over-lebanon> (accessed 4 April 2008).
- <sup>31</sup> Arkin, 116.
- <sup>32</sup> Arkin, 115.
- <sup>33</sup> Matt M. Matthews, "Unprepared: The 2006 Hezbollah-Israeli War." The Long War Series Occasional Paper 26. Fort Leavenworth, KS: U.S. Army Combined Arms Center Combat Studies Institute Press, February 2008, 1. <http://www-cgsc.army.mil/carl/download/csipubs/matthewsOP26.pdf> (accessed 4 April 2008)
- <sup>34</sup> Alastair Crooke and Mark Perry. "How Hezbollah Defeated Israel." *Asian Times Online*, 12 October 2006, [http://www.atimes.com/atimes/Middle\\_East/HJ12Ak01.html](http://www.atimes.com/atimes/Middle_East/HJ12Ak01.html) (accessed 4 April 2008).
- <sup>35</sup> Waxman, 31.
- <sup>36</sup> Anthony H. Cordesman, *Preliminary "Lessons" of the Israeli-Hezbollah War*. CSIS Report (Washington, D.C.: Center for Strategic and International Studies, 17 August 2006), 21. [http://www.csis.org/media/csis/pubs/060911\\_isr\\_hez\\_lessons.pdf](http://www.csis.org/media/csis/pubs/060911_isr_hez_lessons.pdf) (accessed 4 April 2008).
- <sup>37</sup> Matthews, 2.
- <sup>38</sup> Ibid, 43.
- <sup>39</sup> Ibid, 25.
- <sup>40</sup> Brookes, 3.
- <sup>41</sup> Cordesman, *Preliminary "Lessons" of the Israeli-Hezbollah War*, 13.
- <sup>42</sup> President George W. Bush, *President's Address to the Nation*, Press Release, (Washington, D.C.: Office of the Press Secretary, 10 January 2007). <http://www.whitehouse.gov/news/releases/2007/01/20070110-7.html> (accessed 6 April 2008).
- <sup>43</sup> John A. Nagl, *Learning to Eat Soup with a Knife: Counterinsurgency Lessons from Malaya and Vietnam*. (Chicago, IL: University of Chicago Press, 2005), 29.
- <sup>44</sup> Generic OIF VIII-IX 'Surge' Lines of Effort designed by the author based upon an OIF VIII-IX unclassified briefing by BG Anderson, Chief of Staff of III Corps and MNC-I, at the Naval War College, 3 March 2008. The generic lines of effort follow Thompson's Five Principles of Counter-insurgency in John A. Nagl's book *Learning to Eat Soup with a Knife: Counterinsurgency Lessons from Malaya and Vietnam*, 29.
- <sup>45</sup> BG Joseph Anderson (USA, Chief of Staff of III Corps and MNC-I during OIF VIII-IX), email interview by author, 24 March 2008.
- <sup>46</sup> LTC Scott Kain (USA, FA 49 Operational Research/Systems Analysis officer in the MND-B J-5), email interview by author. LTC Kain developed the BEAM to provide the 1<sup>st</sup> Cavalry Division Command Group with a quantitative model to articulate the progress of LOOs to achieve objectives during OIF VIII-IX
- <sup>47</sup> Ibid.
- <sup>48</sup> Ibid.
- <sup>49</sup> BG Joseph Anderson (USA, Chief of Staff of III Corps and MNC-I during OIF VIII-IX), email interview by author, 24 March 2008.
- <sup>50</sup> Ibid
- <sup>51</sup> Ibid.
- <sup>52</sup> Milan N. Vego, "Effects-Based Operations: A Critique," 52.
- <sup>53</sup> Anthony H. Cordesman, "A Civil War Iraq Can't Win," *New York Times*, 30 March 2008, <http://www.nytimes.com/2008/03/30/opinion/30cordesman.html?pagewanted=1&ref=todayspaper> (accessed 6 April 2008).
- <sup>54</sup> Nagl, 7. John Nagl relates a quote by British Chief of the General Staff, General Sir John Chapple, in the British Doctrine Manual, Army Code 71451, *Design for Military Operations: The British Military Doctrine*.
- <sup>55</sup> The Joint Warfighting Center, "An Effects-Based Approach: Refining How We Think about Joint Operations," 5.
- <sup>56</sup> Milan N. Vego, "The Problem of Common Terminology," *Joint Forces Quarterly* 43 (4<sup>th</sup> Quarter, 2006), 45.
- <sup>57</sup> Ibid, 49.
- <sup>58</sup> MAJ Francis J. Park (USA, FA59 Planner for 101<sup>st</sup> Airborne Division CJTF-82 OEF staff), email interview by author, 30 March 2008.
- <sup>59</sup> Joint Warfighting Center, *Commander's Handbook for an Effects-Based Approach to Joint Operations*, III-9.
- <sup>60</sup> Luck, 24
- <sup>61</sup> Headquarters Department of the Army, *FM 3-0 Operations*, 13 February 2008, D-2. The Joint Staff, *JP 3-0 Joint Operations*, 13 February 2008, IV-10. Both the Army Field Manual and Joint Publication for *Operations*, have removed a majority of the discussion on an effects-based approach to military operations. The Joint Publication has one direct reference to EBA stating, an "effects-based approach remains within the framework of operational art and

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design helping commanders and their staffs clarify the relationship between tasks and objectives,” IV-10. The Army Field Manual has no reference stating, “Army forces do not use the joint systems analysis of the operational environment, effects-based approach to planning, or effects assessment,” D-2. However, the systematic concepts that effects-based proponents advocated still exist in both versions of doctrine. The analysis of the operating environment using operational variables and references to measures of effectiveness demonstrate the complementary value-added of the effects-based approach to contemporary military operations.

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